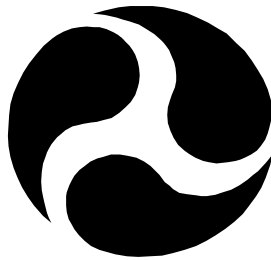


**VOICE SWITCHING
AND
CONTROL SYSTEM (VSCS)
TRAINING AND BACKUP
SWITCH**

(VTABS)



**STATEMENT OF WORK
(SOW)**

DTFA01-92-D-00004

Part of ATTACHMENT J-1

March 07, 1997

INDEX

3.19 VSCS Training and Backup Switch (VTABS).....	1
3.19.1 VTABS Software Licenses, Source, and Liability for Latent Defects.....	1
3.19.1.1 VTABS Software Licenses and Source Code Delivery	1
3.19.1.2 Latent Defect Liability and System Warranty.....	1
3.19.1.3 Bulk Purchase Authorization.....	1
3.19.2 Production.....	1
3.19.2.1 Prime Mission Equipment (PME).....	1
3.19.2.1.1 VTABS Product Support System (VPSS).....	1
3.19.2.1.2 Production Equipment.....	2
3.19.2.1.3 Reliability, Maintainability, Availability (RMA).....	2
3.19.2.1.4 Other Engineering Support.....	2
3.19.2.1.4.1 RMA Modeling and Prediction	2
3.19.2.1.4.2 Failure Modes, Effects and Criticality Analysis.....	2
3.19.2.1.4.3 Failure Mode/Stress Testing	2
3.19.2.1.4.4 Failure Reporting, Analysis and Corrective Action System	2
3.19.2.1.4.5 Interface Management	3
3.19.2.1.4.6 VTABS Consumables.....	3
3.19.2.1.4.7 Mike Monroney Aeronautical Center.....	3
3.19.2.1.5 PEM Mounting.....	3
3.19.3 Project Management.....	3
3.19.3.1 Project Management Cost Reporting.....	3
3.19.4 Configuration Management (CM)	3
3.19.4.1 Configuration Control	3
3.19.4.2 Configuration Status Accounting (CSA).....	4
3.19.4.3 LRU Tracking System	4
3.19.5 Technical Reviews and Audits.....	4
3.19.5.1 FAT/SAT Procedure Reviews.....	4
3.19.5.2 Project Management Reviews (PMRs)	4
3.19.5.3 Configuration Audits.....	4
3.19.5.3.1 Baseline Package Review.....	4
3.19.5.4 Test Preparation Review	5
3.19.5.4.1 Test Preparation Briefing.....	6
3.19.5.5 Technical Interchange Meetings (TIMs) and Reviews.....	6
3.19.5.5.1 TIMs	6
3.19.5.5.2 VTABS Decision Point (VDP) Reviews and Demonstrations	6
3.19.5.5.2.1 Position Electronic Module (PEM) Hardware Design Review	6
3.19.5.5.2.2 VTABS Requirements Review.....	6
3.19.5.5.2.3 VTABS Baseline Description Review	7
3.19.5.5.2.4 VTABS Test Program Review	7
3.19.5.5.2.5 PEM In-Process Demonstrations.....	8
3.19.5.5.2.6 VTABS Early User Involvement (EUI) Activity and Demonstration	8
3.19.6 VTABS Test Program	8
3.19.6.1 Test Performance.....	8

3.19.6.1.1	General	8
3.19.6.1.1.1	Test Program.....	8
3.19.6.1.1.2	Contractor-Conducted Tests.....	9
3.19.6.1.1.3	System Integration and Test.....	9
3.19.6.1.1.4	Government-Witnessed Tests.....	9
3.19.6.1.1.5	Problem Tracking Database	11
3.19.6.1.2	VTABS Product Support System (VPSS) Factory Acceptance Test (FAT)	11
3.19.6.1.3	First Operational Site Acceptance Test	11
3.19.6.1.4	Site Acceptance Test.....	11
3.19.6.1.5	Retest	12
3.19.6.1.6	Technical Field Test and Evaluation.....	12
3.19.6.1.6.1	FAATC and First Operational Site System Delivery	12
3.19.6.1.6.2	FAATC and First Operational Site System Installation and Acceptance Testing	12
3.19.6.1.7	Chassis Burn-In.....	13
3.19.6.2	Test Documentation	13
3.19.6.2.1	Contractor Master Test Plan (CMTP).....	13
3.19.6.2.2	Test Procedures	13
3.19.6.2.3	Test Reports	13
3.19.7	Installation, Integration, and Acceptance.....	13
3.19.7.1	Site Survey Report and Site Specific Site Activation Plan	13
3.19.7.1.1	Site Survey Report.....	14
3.19.7.1.2	Site Specific Site Activation Plan (SSSAP).....	14
3.19.7.2	Site Installation	14
3.19.7.2.1	Packing, Shipping, Off-Loading, and Placement.....	14
3.19.7.2.1.1	Transient Storage	15
3.19.7.2.2	Physical Installation	15
3.19.7.2.3	Electrical Installation and Cabling.....	15
3.19.7.2.4	Constraints.....	15
3.19.7.3	Site Acceptance Test (SAT).....	15
3.19.7.3.1	Site Acceptance Report (SAR).....	15
3.19.7.3.2	Tools and Test Equipment	15
3.19.8	Integrated Logistics Support (ILS).....	16
3.19.8.1	Integrated Logistics Support Program.....	16
3.19.8.1.1	Hardware Maintenance.....	16
3.19.8.1.1.1	Field/Site Maintenance	16
3.19.8.1.1.2	Depot Level Repair Support.....	16
3.19.8.1.2	Software Maintenance	16
3.19.8.1.2.1	Contractor-Provided Software Maintenance	16
3.19.8.1.2.2	Escrow Account.....	16
3.19.8.2	National Airspace Integrated Logistics Support (NAILS) Program Requirements	17
3.19.8.2.1	Logistics Support Data	17
3.19.8.3	Other Documentation Update	17
3.19.8.4	Supply Support/Spares.....	17
3.19.8.4.1	Installation	17
3.19.8.4.2	After Government Acceptance.....	17
3.19.8.4.3	Site Spares.....	17

3.19.8.4.4 Depot Spares	17
3.19.8.5 Support and Test Equipment	17
3.19.8.5.1 Tools and Test Equipment	17
3.19.8.5.2 Special Tools and Test Equipment.....	17
3.19.8.5.2.1 Delivery of Special Tools and Test Equipment.....	18
3.19.8.5.2.2 Special Test Procedures and Techniques.....	18
3.19.8.5.2.3 Calibration Maintenance Requirements Summary (CMRS)	18
3.19.8.6 Manuals and Instruction Books	18
3.19.8.6.1 VTABS Drawings and Lists	19
3.19.8.6.1.1 Engineering Drawings and Lists.....	19
3.19.8.6.1.2 Site Installation Drawings	19
3.19.8.6.1.2.1 Red-lines to DSR Drawings	19
3.19.8.6.1.3 Installation Drawings and Instructions.....	19
3.19.8.6.2 Version Description Document	19
3.19.8.6.3 Commercial Software Manuals.....	19
3.19.8.6.4 Software Maintenance Manuals.....	19
3.19.8.6.4.1 Software Maintenance Manual, Level 2	19
3.19.8.6.5 Firmware Support Manual.....	20
3.19.8.7 Contractor Support Services	20
3.19.8.7.1 Contractor Support Services at the FAATC	20
3.19.8.7.1.1 Contractor Engineering Support Services at the FAATC	20
3.19.8.7.1.2 Contractor Hardware Maintenance Support Services at the FAATC.....	20
3.19.8.7.1.3 Contractor Software Maintenance Support Services at the FAATC	21
3.19.8.7.2 Contractor Support Services at the FAAAC.....	21
3.19.8.7.2.1 Contractor Engineering Support Services at the FAAAC	21
3.19.8.7.2.2 Contractor Maintenance Support Services at the FAAAC	21
3.19.8.7.3 Contractor Repair Service (CRS).....	21
3.19.8.7.3.1 Repairable Items	21
3.19.8.7.3.2 Testing, Inspection, and Quality Control.....	21
3.19.8.7.3.3 Repair Priorities	21
3.19.8.7.3.4 Shipment of Repairable Items.....	21
3.19.8.7.3.5 Repair Procedures.....	22
3.19.8.7.3.6 Data Submittals, Data Accumulation, and Reports.....	22
3.19.8.7.3.7 Points of Contact and Shipping Points	22
3.19.8.7.4 Pre-Acceptance Maintenance Support.....	22
3.19.8.7.5 Technical Assistance	22
3.19.8.8 Life Cycle Parts and Service Data.....	22
3.19.9 Training.....	23
3.19.9.1 General Requirements	23
3.19.9.1.1 OT&E Familiarization.....	23
3.19.9.1.1.1 VTABS OT&E Familiarization	23
3.19.9.1.2 Air Traffic (AT) Training.....	23
3.19.9.1.2.1 VTABS AT Master Instructor/Supervisor Course	23
3.19.9.1.2.2 VTABS AT Database Management Course.....	23
3.19.9.1.3 Airway Facilities (AF) Training	24
3.19.9.1.3.1 VTABS AF Systems Overview Course.....	24

3.19.9.1.3.2 VTABS AF Site Maintenance Course	24
3.19.9.1.3.3 VTABS AF Database Management Course.....	24
3.19.9.1.4 Software Support Training	24
3.19.9.1.4.1 VTABS Software Maintenance (Level 2) Training Course.....	24
3.19.9.2 Course Outcome Requirements	24
3.19.9.2.2 Air Traffic (AT) Training.....	24
3.19.9.2.2.1 VTABS AT Master Instructor Course	24
3.19.9.2.2.2 VTABS AT Database Management Course.....	25
3.19.9.2.3 Airway Facilities (AF) Training	25
3.19.9.2.3.1 VTABS AF Systems Overview Course.....	25
3.19.9.2.3.2 VTABS Site Maintenance Course.....	25
3.19.9.2.3.3 VTABS AF Database Management Course.....	26
3.19.9.2.4 Software Support Training	26
3.19.9.2.4.1 VTABS Software Maintenance (Level 2) Training Course.....	26
3.19.9.3 Student Prerequisites	26
3.19.9.4 Training Materials	26
3.19.9.4.1 COTS/NDI Training Materials	27
3.19.9.4.2 COTS/NDI Training Materials Requirements.....	27
3.19.9.5 Training Program Implementation	27
3.19.9.5.1 Contractor-Conducted Training and Familiarization.....	27
3.19.9.5.1.1 VTABS AT OT&E Familiarization	27
3.19.9.5.1.2 VTABS AF OT&E Familiarization	28
3.19.9.5.1.3 VTABS AF Site Maintenance Course	28
3.19.9.5.1.4 VTABS Software Maintenance (Level 2) Course	28
3.19.9.5.2 Course Validation.....	28
3.19.9.5.3 Course Conduct	28
3.19.9.5.3.1 Instructional Materials.....	28
3.19.9.5.3.2 Class Roster and Certificate of Training	29
3.19.9.5.3.3 End-of-Course Evaluation.....	29
3.19.9.6 Delivery and Revision of Materials.....	29
3.19.10 Quality Control Program	29
3.19.11 Government Review and Disposition of Government Comments to CDRL Items	29

3.19 VSCS Training and Backup Switch (VTABS)

The Contractor shall provide personnel, material, services and facilities as stated herein to fabricate, deliver, install, integrate, test, and support the products described herein. The data delivered as a result of performing the tasks described herein shall be prepared in accordance with the instructions contained herein. VTABS CDRL items associated with VSCS CDRL items shall be delivered as change pages or addenda to the VSCS CDRL items in accordance with the associated DIDs.

3.19.1 VTABS Software Licenses, Source Code, and Liability for Latent Defects

3.19.1.1 VTABS Software Licenses and Source Code Delivery - The Contractor shall provide the software licenses to the Government for all software required under this contract, and, if ordered by the Government, licenses for all software tools used to design, develop, produce, install, and maintain the delivered software. The Contractor shall provide the Government the authorization to prepare, without restriction, a back-up copy of all software used in the VTABS. The term Software is meant to include Firmware.

The Contractor shall deliver to the Government all VTABS source code for which there was any Government funding applied, including all code imported from VSCS and the DSAVS Programs, and all code for which Government funding was applied to modify it to make it suitable for use in VTABS.

3.19.1.2 Latent Defect Liability and System Warranty - The Contractor shall be liable for all "latent defects" in VTABS for one (1) year following completion of CAI at the first delivered operational site. A latent defect is defined as any hardware/software/documentation furnished by the Contractor under the VTABS effort that is not in compliance with the VTABS requirements as defined in this Statement of Work and in the VTABS Specification, or that causes degradation in VTABS performance or functionality.

3.19.1.3 Bulk Purchase Authorization - All personal computers and T-Bar equipment may be purchased as a single bulk buy, to be stored in a bonded warehouse at no cost to the Government. The warranty start date shall begin when the equipment is shipped to the site.

3.19.2 Production

3.19.2.1 Prime Mission Equipment (PME) - The Contractor shall design, produce, test, deliver, and install the VTABS equipment, as ordered by the Government, according to the quantities and schedule as described in Sections B and F of the Contract. Harris shall use excess material from the VSCS to the maximum extent possible. The VTABS equipment shall also support the use of the existing FAA Transition Switches. The software delivered with the systems shall be at least to the level of VSCS ORD 6.3, as delivered to the VSCS sites at the conclusion of FAATC OT&E.

3.19.2.1.1 VTABS Product Support System (VPSS) - The Contractor shall design, produce and stage the first VTABS at the Contractor's facility. The Contractor shall perform Factory Acceptance Test (FAT) at the Contractor's facility in accordance with 3.19.6, VTABS Test Program. Following completion of the Harris VTABS development support, the VPSS shall be destaged, refurbished, and configured for Boston per Exhibit C.4 of the Contract. Residual circuit cards shall be transitioned to the VSCS Depot for use at other sites or as spares.

3.19.2.1.2 Production Equipment - The Contractor shall deliver all VTABS equipment in accordance with the requirements of FAA-E-2914, VTABS Specification.

3.19.2.1.3 Reliability, Maintainability, Availability (RMA) - The Contractor shall perform an engineering evaluation of environmental and other factors to which VTABS and Transition Switch components will be subjected during operation which may be different than that to which VSCS components are exposed. The Contractor shall determine whether these factors will cause any change to projected failure rates of VSCS system elements to be shared with VTABS and/or the Transition Switch.

The Contractor shall predict failure rates for new or modified system elements introduced by VTABS or the Transition Switch.

3.19.2.1.4 Other Engineering Support - The Contractor shall perform the following in support of the unique VTABS and Transition Switch items.

3.19.2.1.4.1 RMA Modeling and Prediction - The Contractor shall maintain an RMA model and predictions to address requirements in FAA-E-2914. The Contractor shall revise the model and predictions in accordance with MIL-STD-785, Tasks 201 and 203 to reflect changes to the design that affect the results of predictions and actual RMA data delivered from testing. The results of the RMA modeling and predictions shall be included in VSCS CDRL VP025.

3.19.2.1.4.2 Failure Modes, Effects, And Criticality Analysis - The Contractor shall update and maintain the VSCS Failure Modes, Effects, and Criticality Analysis (FMECA) program to include the unique VTABS requirements in FAA-E-2914.

3.19.2.1.4.3 Failure Mode/Stress Testing - The Contractor shall perform a Failure Mode/Stress Test as part of the FAT. This test shall be used to determine the system's reaction to combinations of stressful inputs and load conditions and to verify or uncover problems with the recovery mechanisms of the VTABS. The Contractor shall plan and provide for the collection, maintenance, and analysis of all relevant testing data and for identifying and resolving VTABS problems as a result of the testing.

3.19.2.1.4.4 Failure Reporting, Analysis and Corrective Action System - The Contractor shall update and maintain the VSCS Failure Reporting, Analysis, and Corrective Action System (FRACAS) program to include the unique VTABS requirements in FAA-E-2914.

3.19.2.1.4.5 Interface Management - The Contractor shall maintain an interface management program that includes all VTABS hardware and software interfaces to meet the requirements in FAA-E-2914.

3.19.2.1.4.6 VTABS Consumables - The Contractor shall identify and deliver the VTABS-unique consumables required to support VTABS operations at each site.

3.19.2.1.4.7 Mike Monroney Aeronautical Center - The Contractor shall provide and integrate the support hardware, support software and test equipment necessary to meet the Aeronautical Center VTABS Requirements as identified in the approved VTABS Training Equipment Study.

3.19.2.1.5 PEM Mounting -

- a. The VTABS PEM shall be installed on a separate shelf (PEM shelf) in both the Backup and Training Subsystems. This shelf will be provided as GFE. Installation of the PEM shelf will be completed by the DSR Contractor.
- b. The Contractor shall provide all the necessary extra cables, brackets and tie-downs required for PEM installation on the PEM shelf. It is anticipated that 1175 PEM shelf assemblies will be required for VTABS, including those required for site installation and installation spares.

3.19.3 Project Management

The Contractor shall establish a VTABS project management program to plan, organize, direct, and control all activities necessary to meet the requirements of FAA-E-2914, VTABS specification.

3.19.3.1 Project Management Cost Reporting - The Contractor shall include cost and schedule performance status information for VTABS cost reimbursable SLINS in VSCS CDRL VP07.

3.19.4 Configuration Management (CM)

The Contractor shall implement a Configuration Management program on all VTABS hardware, software, firmware and documentation, excluding training and curriculum materials. The Contractor shall submit his proposed Configuration Management Plan to the Government with his VTABS Proposal.

3.19.4.1 Configuration Control - The Contractor shall propose any changes to the Product baselines as Engineering Change Proposals (ECPs). Contract Clause H.58 is applicable.

The Contractor shall develop and process ECPs in accordance with FAA-STD-021, Appendix VIII and Appendix IX.

The Contractor shall develop any required Notice of Revisions (NOR) for every document affected by an ECP for which the Contractor is not the custodian, including GFP documentation, to accompany each ECP in accordance with DOD-STD-480, Section 5.

The Contractor shall submit waivers and deviations in accordance with DOD-STD-480, Sections 7 and 8. Upon completion of the Contractor-required action, the proper documentation for minor deviations/waivers will have the local FAA Quality Reliability Office concurrence and approval prior to implementation, unless otherwise directed by the FAA Contracting Officer.

The Contractor shall develop procedures describing how approved changes to the VTABS hardware, software, and documentation configurations, including maintenance and user documentation, will be coordinated with the Government and released to each VTABS site.

The Contractor shall maintain configuration control of all VTABS hardware and software such that each operational site has a functionally equivalent and interchangeable hardware and software configuration, including compatible physical interfaces, and excluding only site data base and system size considerations. The contractor's configuration control shall include provisions for migration of improved and new system components into any systems prior to FAA acceptance.

The VTABS Contractor shall process any changes to the Product Baseline ensuring that there is FAA notification of any proposed change.

3.19.4.2 Configuration Status Accounting (CSA) - The Contractor shall provide Configuration Status Accounting (CSA) Information in the same format and frequency as currently being provided for the VSCS program.

3.19.4.3 LRU Tracking System - The Contractor shall provide LRU tracking for the VTABS using the existing VSCS Bar Code System.

3.19.5 Technical Reviews and Audits

The Contractor shall plan, support, conduct and participate in technical reviews and audits. Unless otherwise stated, these reviews shall be conducted at the Contractor's facilities.

3.19.5.1 FAT/SAT Procedure Reviews - The Contractor shall conduct test procedure reviews with the Government-appointed test director or Government-designated representative, to determine which tests if any can be eliminated or reduced under the guidelines of a COTS/NDI test program (FAA Order 1810.6).

The Contractor shall provide COTS/NDI test results to the Government-appointed test director or designated representative, to support the decision to reduce testing. The reduction or elimination of tests shall not connote the waiver of any requirements associated with those tests.

3.19.5.2 Project Management Reviews (PMRs) - The Contractor shall report on the status of VTABS as part of each VSCS PMR.

3.19.5.3 Configuration Audits

3.19.5.3.1 Baseline Package Review - The Baseline Package Review (BPR) for VTABS shall consist of reviewing all VTABS documentation, software and hardware to establish the Product Baseline. The Baseline Package Review will show that the functions of the configured system comply with the VTABS requirements.

The BPR will be conducted in two parts. The Contractor shall support the conduct of Part I of the VTABS BPR after completion of SAT at the FAATC. The successful completion of Part I will be establishment of the VTABS Hardware Product Baseline. A sample of items required for Part I of the VTABS BPR are as follows:

- a. A listing of all VTABS hardware components, by part number (VP118).
- b. Product drawings and documentation associated with the listed HW components (VP111 and VP112).

- c. Special tools and test equipment, and associated drawings and documentation (VP116 and VP117).
- d. Operating instructions for all VTABS equipment(may be in draft format) (VP99).
- e. Commercial Software and Hardware Manuals (VP111).

The Government will review a percentage of the hardware documentation against the hardware item. This percentage is a variable dependent upon whether discrepancies are noted.

The above items will be the used to establish the VTABS HW Product Baseline.

The VTABS BPR Part II shall be conducted after completion of the first delivered operational site SAT. Part II of the BPR will consist of a review of all final documentation against contract requirements. The SW Product Baseline will be established during Part II. A sample of the items to be reviewed are as follows:

- a. The Version Description Document (VP103).
- b. The CM process used to establish the baseline.
- c. The Final version of operating instructions for all VTABS equipment (VP99).

The above items will be used to establish the VTABS Software Product Baseline. A letter of completion will be sent to the contractor with the listing of the VTABS HW and SW Product Baseline elements that will be entered into the ECP process.

3.19.5.4 Test Preparation Review - The Contractor shall conduct a Test Preparation Review (TPR) to determine if all planning and preparation for testing has been accomplished prior to the start of Factory Acceptance Test and FAATC SAT. The Contractor shall conduct the review for the Government prior to the scheduled start of the formal test. The Contractor shall include as a minimum the following review topics:

- a. Requirement changes
- b. Design changes
- c. Test procedure changes
- d. Test limitations
- e. Summary of all pre-test dry runs
- f. Schedule of events

The review shall be conducted in accordance with Contractor-established format for Government approval prior to commencement of the test.

3.19.5.4.1 Test Preparation Briefing - The Contractor shall conduct a Test Preparation Briefing to determine if all planning and preparation for testing has been accomplished prior to the start of SAT at the field facilities (FAATC excluded). The Contractor shall conduct the review for the Government prior to the scheduled start of the formal test. The Contractor shall include as a minimum the following review topics:

- a. Requirement changes
- b. Test limitations
- c. Summary of all pre-test dry runs.

3.19.5.5 Technical Interchange Meetings (TIMs) and Reviews - The Contractor shall administratively support the TIMs and reviews described herein and provide minutes of each in accordance with VP03.

3.19.5.5.1 TIMs - At the request of the Government or of the Contractor, Technical Interchange Meetings (TIMs) may be held to discuss in detail any issues, e.g., technical, logistics, and training, that require mutual resolution or further clarification. TIMs and Conferences should be considered by the Contractor only for the affected Government technical group. The Contractor should estimate four (4) TIMs with an estimated duration of two (2) days each. Additional TIMs to cover issues other than critical Program Management or Contractor performance issues, with an average duration of one (1) day each, shall be held as ordered.

3.19.5.5.2 VTABS Decision Point (VDP) Reviews and Demonstrations - The Contractor shall conduct a minimum of four (4) VTABS Decision Point Reviews and three (3) demonstrations. At the conclusion of each VDP Review/ demonstration, the FAA Contracting Officer will either accept or reject the VDP event not later than ten (10) working days after completion of that VDP Review. All VDP events shall occur at the Contractor's facility. The VDP Reviews/demonstrations shall include, as a minimum, the following:

3.19.5.5.2.1 Position Electronic Module (PEM) Hardware Design Review - The PEM Hardware Design Review shall include, as a minimum, the following subjects/items:

- a. Identification of all PEM subsystems, functions, and interfaces,
- b. Identification of subsystem components and main interfaces,
- c. Identification and functional definition of all CCAs,
- d. Identification of all PEM interfaces and non-PEM items,
- e. Summary of trade studies leading to current PEM design,
- f. Schedule and status of on-going PEM development,
- g. PEM issues to be resolved, and
- h. Identification of design issues which require early FAA insight.

3.19.5.5.2.2 VTABS Requirements Review - The VTABS Requirements Review shall include, as a minimum, the following subjects/items:

- a. Identification and summary of requirements allocation to major VTABS components,
- b. Identification of major VTABS components and interfaces,
- c. Identification of all derived requirements,

- d. Discussion of performance, RMA, and timing requirements and how they have been "assigned" to the VTABS architecture,
- e. Identification of requirements issues, and
- f. Identification of design issues which require early FAA insight.

3.19.5.5.2.3 VTABS Baseline Description Review - The VTABS Baseline Description Review shall include, as a minimum, the following subjects/items:

- a. Summary of VTABS baseline architecture and major subsystems, to include:
 - 1. Training subsystem
 - 2. Backup subsystem
- b. Summary of VTABS data functional flows and interfaces, to include:
 - 1. Training subsystem
 - 2. Backup subsystem
- c. Summary of design for each major subsystem, to include:
 - 1. Training subsystem
 - 2. Backup subsystem
- d. Summary of sizing, capacity, and performance for each subsystem, to include:
 - 1. Training subsystem
 - 2. Backup subsystem
- e. Status of software development/rehost/modifications to COTS,
- f. Status of hardware development/modifications to COTS,
- g. Summary of facility issues for VTABS installation, and
- h. Issues and schedule update.

3.19.5.5.2.4 VTABS Test Program Review - The VTABS Test Program Review shall include, as a minimum, the following subjects/items:

- a. Overview of test program (review of CMTP),
- b. Identification/status of VTABS test tools, hardware and software,
- c. Current VTABS Test status, including test documentation status,
- d. Overview of VPSS Factory Acceptance Test,
- e. Overview of Site Acceptance Test,
- f. VTABS Design Update, as needed,

- g. Summary of facility issues,
- h. Issues and schedule update, and
- i. OT&E Training status.

3.19.5.5.2.5 PEM In-Process Demonstrations - The Contractor shall conduct two (2) PEM In-Process Demonstrations. The first shall be a PEM chassis demonstration. The PEM shall be fully populated and emulation shall be provided to demonstrate functionality. The second shall demonstrate full functionality of the PEM at the system level without emulation. The PEM shall be interfaced with an operational voice switch to verify the hardware and software capabilities, the ability to switch to the VEM, and the ability to receive and place calls via the VSCS Display Modules. The dates of these demonstrations will be as agreed to between the Government and the Contractor.

3.19.5.5.2.6 VTABS Early User Involvement (EUI) Activity and Demonstration - The Contractor shall support a two-day activity, primarily conducted by the FAA. The Contractor shall provide a briefing and support as needed during the two days. The dates of this demonstration will be as agreed to between the Government and the Contractor.

3.19.6 VTABS Test Program

The Contractor shall develop and implement a test program for the VTABS to verify the system's physical, functional, and performance requirements as defined in FAA-E-2914, at the Contractor's production facility. Testing shall conform to the approved Contractor Master Test Plan (CMTP).

The Contractor shall furnish the equipment, tools, space, test equipment, test plans and procedures, and personnel to accomplish all testing performed in the Contractor's facility. The Contractor shall furnish test equipment, tools, test plans and procedures, and personnel required for testing equipment being installed at each site.

The Contractor shall design, develop, test and deliver to the Government two (2) VTABS loading tools (VTCs) in accordance with Attachment J.11 of the contract. This tool shall be used during VPSS FAT to provide the maximum load to the VTABS. Following completion of the VPSS FAT, one VTC shall be packaged and delivered to the FAA Technical Center for use in the FAA-conducted OT&E of VTABS. The second VTC shall remain at the Contractor's facility until further direction is provided. Documentation of the loading tool shall be in Contractor format.

3.19.6.1 Test Performance

3.19.6.1.1 General - The Contractor shall perform all testing required to verify that the VTABS, as designed and implemented, satisfies the requirements of FAA-E-2914. This testing shall include factory testing on the VPSS, Site Acceptance Test at the FAATC (FSAT), Site Acceptance Test of the First Delivered Operational Site System, and Site Acceptance Test (SAT) at each site where the Contractor has performed installation of VTABS. All testing shall be in accordance with the CMTP.

3.19.6.1.1.1 Test Program - The VTABS test program shall be conducted in accordance with FAA Order 1810.6, Policy for Use of NDI in FAA Acquisitions. Previous test results or Contractor product documentation shall be used to verify VTABS test requirements, in lieu of testing, where deemed appropriate by the Government-appointed test director or designated representative.

3.19.6.1.1.2 Contractor-Conducted Tests - All Contractor-conducted tests shall use site specific configuration maps for both the Training and Backup portions of VTABS. The parameters required to develop these maps shall be defined as part of the Site Survey. Each VTABS shall be tested with correct site configuration maps.

3.19.6.1.1.3 System Integration and Test - The Contractor shall conduct System Integration and Test on all new software, and on new or repackaged hardware. System Integration and Test will be monitored by the FAA Test Director's representative on a non-interference basis. Informal or dry runs of system test and integration tests shall not be admissible for formal acceptance unless the system has conformed to the configuration management requirements outlined in 3.19.4. The Contractor shall provide to the FAA Test Director's representative a schedule of test activities prior to start of test in order to allow the FAA Test Director's representative to monitor the test activities. The Contractor shall provide the FAA Test Director's representative one (1) copy of red-lined test procedures, test logs, and test discrepancy reports at the conclusion of the test.

3.19.6.1.1.4 Government-Witnessed Tests - All Government-witnessed tests shall be conducted in accordance with following:

- a. All tests shall be conducted in accordance with Contractor developed and Government-approved test plans and procedures (CMPT and CDRL VP109). Deviation from the approved procedures can occur at the direction of the Government-appointed test director or designated representative. Deviation from the Government-approved procedures shall be noted in the test log and redlined on the working procedure document.
- b. The Contractor shall provide the Government a Notice of Intent to conduct the Factory Acceptance Test on the VPSS not less than ten (10) working days prior to the start of the test and confirm the test starting date and expected length of the test five (5) working days in advance of the test start.
- c. The Contractor shall brief a Government-appointed test director or designated representative prior to the start of each test. The briefing shall describe the Contractor's readiness for the test, the objective(s) of the test, a description of the test scenarios, and the expected test results.
- d. Prior to the start of the test, the system under test shall undergo a unit-under-test baseline inspection by a designated Government representative. The system shall then be sealed, establishing a unit-under-test baseline configuration.

- e. During testing, the Contractor shall respond to direction on test conduct only from the Government-appointed test director, or designated representative. The Government-appointed test director's, or designated representative's, authority will include ensuring Contractor compliance with the approved test plan and procedures governing the specific tests. The Government has the option to add additional test witnesses.
- f. The Contractor shall maintain an official test log containing test identification, description of the unit under test, copies of the calibration checklist for all test equipment, date and time of test, procedures, collected results, and discrepancy reports. The test log shall also record any changes to the unit-under-test configuration. The Government-appointed test director or designated representative, and the Government QRO, as part of the Contractor test witnessing responsibility, will sign acceptance of test results when the test has been correctly performed and the results have been signed by the Contractor's representative.
- g. Where the Contractor has deviated from the Government-approved procedure without approval from the Government-appointed test director, or designated representative, or has obtained results that do not indicate verification of the requirements, the Contractor shall record the discrepancy in the test log and on a discrepancy reporting form. The Contractor shall maintain a discrepancy and/or clarification form which details and provides an audit trail for any discrepancy or request for clarification from the Government. The report shall describe the circumstances of the discrepancy and shall be signed by the Government-appointed test director or designated representative and the Contractor's test director. The Contractor shall perform analyses to determine if the collected results can be accepted, or if the as-performed procedures indicate compliance with the requirement. The Contractor shall report the results of the analysis to the Government-appointed test director, or designated representative. After receipt of the results of the analyses, the Government will decide whether or not to accept the results or to require a retest. The Contractor shall provide one copy of the red-lined test procedures to the Government-appointed test director or designated representative (CDRL VP109).
- h. Deviations or waivers to requirements shall be submitted by the Contractor for Government approval. Deferrals of requirements may be issued by the Government for requirements that can not be verified at the Contractor's facility and/or if the system under test does not include the subsystems necessary to verify the requirement.
- i. Once results have been validated (through analysis or retest), the Government-appointed test director, or designated representative, will sign the test log and results. A copy of the test log, including data collected during the test, shall be provided to the Government-appointed test director or designated representative at the completion of the test (CDRL VP110). A list of any discrepancies revealed by prior testing shall be furnished to the Government-appointed test director not more than five (5) days after completion of all tests.
- j. Formal FAT shall consist of a requirements qualifications test, a 48 hour stability test, a system stress test, and fault injection and failure recovery. Environmental and EMI shall be conducted informally during System Integration and Test (SI&T). All other system verification activities shall be conducted during FAT.

3.19.6.1.1.5 Problem Tracking Database - The Contractor shall record all FAT and FSAT test discrepancies in a problem tracking database. The Contractor shall provide the Government a hard copy report of all open discrepancies following completion of FSAT. The Contractor shall enter all open test discrepancies after FSAT regression test into the Contractor's VSCS Oracle database at least 30 days prior to the start of OT&E. The Contractor shall provide the Government local access to the Oracle database on a non-interfering basis.

3.19.6.1.2 VTABS Product Support System (VPSS) Factory Acceptance Test (FAT) - The Contractor shall conduct a formal Factory Acceptance Test (FAT) of the VPSS to verify all physical, functional, and performance requirements contained in FAA-E-2914, and referenced technical requirements documentation. VPSS FAT shall verify functional and performance compliance in single function stand-alone tests and in multifunction scenario driven tests representative of a realistic environment. The Contractor shall conduct the VPSS FAT at the Contractor's facility on the VPSS. Supplemental VPSS FAT shall be conducted as necessary to verify complete compliance with the VTABS specification (FAA-E-2914). The Contractor shall provide all test equipment, special tools such as card extenders and inserts, and the emulators necessary to simulate the VTABS external operating environment (automatic loading will be required). The VPSS FAT will include testing to special requirements; special test provisions are discussed in detail in FAA-E-2914, the VTABS specification.

The tests shall be conducted in the presence of the Government-appointed test director or designated representative, who will witness all tests and validate the test results collected.

The Government will require one week for familiarization activities on the VPSS after satisfactory completion of Factory Acceptance Test and completion of the OT&E Familiarization Course conduct. The Contractor shall provide Systems Engineering and Software support for this activity.

3.19.6.1.3 First Operational Site Acceptance Test - The Contractor shall conduct a Site Acceptance Test for the First Operational Site System delivered to the first operational site. This test shall include tests of all external interfaces and functions not previously tested at the factory or at the FAATC.

3.19.6.1.4 Site Acceptance Test - The Contractor shall conduct Site Acceptance Tests to verify that each system has been properly installed at Government facilities. In addition, the Site Acceptance Test shall verify site specific aspects of the VTABS that can not be verified in the Contractor's facility due to resources or interfaces that are only available at the installation site. A Site Acceptance Test shall be performed on each system delivered and installed by the Contractor prior to its acceptance by the Government at each site. FAATC SAT (FSAT) shall be performed on the system delivered to the FAATC.

The Contractor shall perform the Site Acceptance Test (SAT) in accordance with Government-approved site test procedures to test and demonstrate that the VTABS equipment is installed in accordance with the site survey. The SAT will be witnessed by the Contracting Officer or his representative, who will witness the Contractor's testing in accordance with 3.19.6.1.1.

The Contractor shall conduct the FAATC Site Acceptance Test (FSAT) on the system delivered and installed at the FAA Technical Center. The FSAT shall include testing of all VTABS requirements which could not be completed in the factory. At the conclusion of FSAT, the FAATC VTABS shall be turned over to the Government test organization for Operational Test and Evaluation (OT&E). The FSAT shall be performed in accordance with 3.19.7.3, Site Acceptance Test.

The Contractor shall provide Site Acceptance Test procedures for each facility. The Contractor shall include the SAT procedures in CDRL VP109. The SAT procedures shall be provided to the FAA Test Director for approval. The SAT procedures shall be available to the FAA Test Director at least 45 days prior to the FAATC SAT. The SAT procedures shall either contain a site specific appendix for each site, or each site shall have its own unique SAT procedures.

3.19.6.1.5 Retest - Failure of the VTABS system during FSAT, SAT, OT&E at the FAATC, or during retesting after making changes to the current baseline to satisfy the specific test criteria, shall require the Contractor to determine the reason for the noncompliance and to report the cause of the noncompliance and the proposed fix to the Government in writing prior to submission for retest. The Contractor shall be responsible for all corrective action necessary to ensure full compliance with this SOW and the VTABS specification. Corrective actions and post-FSAT regression test activities will be incorporated into the VSCS problem resolution and corrective action process. On any retest action, the Contractor shall be responsible for identifying the cause of the problem, identifying a solution to fix the problem, and proposing a fix to the Government. In addition, the Contractor shall be responsible for identifying any subsystems of the VTABS affected by the problem or its proposed solution. The Contractor shall complete all repair or rework prior to submission for retest.

The Contractor shall provide a schedule for retest and the coverage of the retest, including any regression testing required on the system for FAT, SAT, and FSAT. The Government reserves the right to determine the scope of retest, including complete retest of the system. A five working day notice shall be provided to the Government for all retests. The retest shall be conducted in accordance with the original procedure, or as modified and approved by the Government. Retests shall be conducted in the presence of the Government-appointed test director or designated representative, who will witness all tests and validate the test results collected. An analysis of all corrections to anomalies or failures shall be presented during the retest period. Any further testing and/or demonstrations or anomalies or failures which resulted from the retest period shall be coordinated and approved by the Government.

3.19.6.1.6 Technical Field Test and Evaluation

3.19.6.1.6.1 FAATC and First Operational Site System Delivery - As ordered by the Government and subsequent to the completion of VPSS testing, the Contractor shall deliver to the FAATC the VTABS equipment as described in the contract.

As ordered by the Government, the Contractor shall deliver the First Operational Site System to the initial operational site as described in the contract.

3.19.6.1.6.2 FAATC and First Operational Site System Installation and Acceptance Testing - As ordered by the Government, the Contractor shall install the VTABS equipment at the FAATC location specified and conduct a site installation, integration and acceptance test as specified in 3.19.6.1.4 and 3.19.7.

As ordered by the Government, the Contractor shall install the First Operational Site System at the first site, per the Government-approved site survey, and conduct a site installation, integration and acceptance test as specified in 3.19.6.1.4 and 3.19.7.

3.19.6.1.7 Chassis Burn-In - The Contractor shall conduct a 48-hour burn-in of each VTABS chassis to be delivered to the Government.

3.19.6.2 Test Documentation - The Contractor shall be responsible for documenting the VTABS test program in the form of plans, procedures, and reports. The Contractor shall develop a Contractor Master Test Plan documenting the overall test program, test procedures and reports for each formal test.

3.19.6.2.1 Contractor Master Test Plan (CMTP) - The Contractor shall prepare a Contractor Master Test Plan which, when approved by the FAA Contracting Officer, shall serve as the overall test control document for the Contractor's VTABS test program. The CMTP shall provide for the following test phases:

- a. VPSS Factory Acceptance Test (FAT);
- b. FAATC Site Acceptance Test (FSAT);
- c. Site Acceptance Test (SAT).

3.19.6.2.2 Test Procedures - The Contractor shall prepare test procedures for all formal tests in accordance with CDRL VP109, and shall make these procedures available via soft copy. No formal testing shall commence until the procedures have been reviewed and approved by the Contracting Officer or his representative.

3.19.6.2.3 Test Reports - The Contractor shall prepare a test report for all formal tests in accordance with CDRL VP110.

3.19.7 Installation, Integration, and Acceptance

In cooperation with the Display System Replacement (DSR) Program Contractor and under specific guidance from the Government, the Contractor shall deliver, install, integrate, and test the VTABS at Government-designated sites. The Contractor shall provide all personnel, tools, test equipment, installation equipment, software, materials, and services required for these efforts including installation, as required, into the DSR equipment, and connecting the VTABS to facility equipment and the Transition Switch. The Contractor shall provide full-time supervision and direction of its personnel and subcontractors during all phases of the installation activity.

3.19.7.1 Site Survey Report and Site Specific Site Activation Plan - The Contractor shall conduct VTABS site surveys concurrently with all DSR site surveys, where possible and as directed by the Government. The Contractor shall use VSCS and DSR site surveys and associated reports to the maximum extent possible for purposes of defining the VTABS site survey report. The Contractor shall conduct, as necessary, a detailed site survey in conjunction with designated Government representatives to determine the system configuration to which the VTABS will be built and to determine the preparation requirements of the site in the Government-determined location at each site. The Site Survey shall be performed in accordance with the VTABS Site Survey Schedule described in Section F of the contract. The Contractor shall provide a Site Survey Report (VP106).

3.19.7.1.1 Site Survey Report - The Contractor shall develop a Site Survey Report for each site. The Site Survey Report shall identify key technical information regarding the availability and/or modifications required for, as a minimum, power, communication lines or interfaces, cabling, cable trays, penetrations, grounding, proposed modifications to the DSR Consoles in accordance with Government standards and seismic requirements listed in the VTABS Specification, and ducting for VTABS installations into DSR Consoles. The report shall also identify facility modifications required to allow access and installation of cable, conduit, and back room and position equipment. Site related activities that are the responsibility of the Government for installation of VTABS shall be separately identified in the Site Survey Report. The Site Survey Report shall be delivered in accordance with CDRL VP106.

3.19.7.1.2 Site Specific Site Activation Plan (SSSAP) - Based on the data disclosed during the site survey and provided in the Site Survey Report, the Contractor shall develop and deliver a Site Activation Plan for each designated site in accordance with all Government regulations of the VTABS Specification and CDRL VP108. The Contractor shall develop a generic plan for VTABS (SIATD). Site specific information shall be submitted IAW VP108.

The SSSAP shall include an approach to modifying the existing GFE Transition Switch and VSCS connections to facility circuits and frequencies to accommodate VTABS with minimum impact to VSCS and DSR. The SAP shall also identify the VTABS interface with DSR, its integration, DSR Console modifications (if any), cabling and power requirements, and required interactions with the DSR Contractor necessary to implement VTABS into the DSR Consoles. Any additional cable trays shall be designed such that no additional Government cooling or air-handling capacity is required, or the Contractor shall advise the Government in advance of the extent of these requirements.

The SSSAP shall identify the optimum time for the Contractor to gain access to each facility to begin installation.

3.19.7.2 Site Installation - The Contractor shall be responsible for all site installation activities for VTABS in accordance with CDRL VP108. Site installation activities shall include, as a minimum, off-loading, placement, DSR console modification (as required), cable trays (as required) and penetrations, physical installation, and electrical installation and cabling.

The Contractor shall install all VTABS PEM equipment into the Display System Replacement (DSR) Consoles at all FAA facilities. The VTABS backroom equipment shall be installed into the space currently occupied by the NARACS, or equivalent, at each ARTCC. The allowable VTABS backroom space shall not exceed 400 ft².

The Contractor shall be responsible for complying with the following requirements.

3.19.7.2.1 Packing, Shipping, Off-Loading, and Placement - The Contractor shall be responsible for the packing, shipping, off-loading, transient or site storage, loading dock coordination, and placement of all VTABS equipment and material from the Contractor's plant to the Government-designated installation sites. Off-loading, moving, and placing equipment in the designated locations and GFE within the facility shall be the Contractor's responsibility. In no case shall the Contractor deliver a system without a designated Contractor representative present at the site to accept the system from the shipper. The Government will provide facility space in accordance with the provisions described in the site survey report and approved SAP which shall include any additional required documentation and spares storage as a result of VTABS. The Contractor shall remove the packing and shipping materials and other unwanted installation-generated work materials from the site.

3.19.7.2.1.1 Transient Storage - The Contractor shall provide for equipment storage in accordance with Best Commercial Practices.

3.19.7.2.2 Physical Installation - The Contractor shall physically connect VTABS equipment to the Government-approved location within the facility. The Contractor shall supply all mounting hardware and tools necessary to attach the VTABS to collocated rack assemblies, facility flooring, or other connection points as identified in the site survey. The Contractor shall be responsible for emplacement of VTABS position equipment in designated locations in the facility in accordance with applicable physical, electrical and seismic codes as described in the VTABS Specification.

3.19.7.2.3 Electrical Installation and Cabling - The Contractor shall provide and install all required cable trays, penetrations, cabling, wiring, connectors, and associated hardware within the VTABS, between the VTABS and the Government-provided demarcation point for connection to external equipment and power. This requirement includes Contractor-furnished cable trays, electrical cabling and connectors for all special test equipment. The Contractor shall supply all tools and test equipment necessary to install and checkout cabling. All electrical work shall be accomplished in accordance with NFPA-70, local codes (if applicable), the VTABS specification and FAA-C-1217E.

The Government will provide 208 VAC, three phase power to the Contractor's Power Subsystem at each site. The Contractor shall be required to balance the load accordingly. The Contractor shall plan to have the VTABS accept power inputs from more than one breaker panel, according to what is available at each site. The VTABS Training Subsystem non-48 VDC equipment shall be powered from Government-provided critical or essential power.

3.19.7.2.4 Constraints - The Contractor shall perform all installation activities on a non-interference basis. The Contractor shall make adequate provisions in personnel staffing and procedures to allow for flexible use of the on-site personnel to avoid conflicts with other Government activities at the VTABS sites.

Contractor personnel shall abide by all security provisions of the FAA locations being visited, at all times.

The Contractor shall participate in an installation in-briefing with Government-appointed representatives prior to initiating installation activities. The Contractor shall also participate in an out-briefing prior to departing the facility to review the installation and action items.

3.19.7.3 Site Acceptance Test (SAT) - SAT shall be conducted as described in 3.19.6.1.4. CAI will occur at each site after successful conclusion of SAT. The Government will accept each system after successful completion of its respective CAI.

3.19.7.3.1 Site Acceptance Report (SAR) - The Contractor shall develop a SAR documenting the initial performance settings of the equipment (CDRL VP107). The SAR shall also include a listing of the established baseline. The Contractor shall deliver the SAR in accordance with CDRL VP107.

3.19.7.3.2 Tools and Test Equipment - The Contractor shall provide all tools, test equipment, and test jigs for all installation, testing, and maintenance activities on the VTABS during site acceptance until satisfactory completion of CAI. The Contractor shall modify three Government-identified VEM Test Sets to work with both VEMs and PEMs.

3.19.8 Integrated Logistics Support (ILS)

3.19.8.1 Integrated Logistics Support Program - The Contractor shall plan, maintain, and execute the ILS Program to meet the VTABS Specification requirements and the provisions contained herein.

- a. ILS Program Management. The Contractor shall integrate the VTABS ILS program into their existing VSCS Integrated Logistics Support organization. This activity shall include support to the VSCS joint Government-Contractor National Airspace Integrated Support Management Team for VTABS issues.
- b. Subcontractor/Vendor Control. The Contractor shall maintain and be responsible for the VTABS Subcontractor and Vendor ILS programs using Government-approved VSCS procedures and processes.
- c. Life Cycle Cost (LCC) Analyses. The Contractor shall continue the VSCS LCC program for the VTABS.

3.19.8.1.1 Hardware Maintenance - The Contractor shall provide direct site maintenance, restoration, repair, and/or supply support services at each site, for a period not to exceed VTABS ORD at each site, as ordered by the Government. The VTABS will be supported by two levels of hardware maintenance: field/site (first level) and depot (second level).

3.19.8.1.1.1 Field/Site Maintenance - As ordered, the Contractor shall provide site maintenance, restoration, repair, and/or supply support in accordance with existing VSCS CLINs for site maintenance. Field/site maintenance will consist of Government technician/NOM monitoring of equipment status at appropriately located workstations. Built-in fault detection software will detect and report faults to the status monitoring workstations. Detected faults will not be mitigated. Embedded software will fault isolate faults to the lowest replaceable unit (LRU) which will, typically, be the electronic circuit card assembly (CCA) level. LRUs will be removed and replaced during periods of VTABS inactivity.

Maintenance of VTABS and the Transition Switch shall be performed in accordance with the requirements set forth in the Government-provided maintenance handbook.

3.19.8.1.1.2 Depot Level Repair Support - With the exception of VSCS common LRUs that transition to FAA organic maintenance, the Contractor shall provide depot level hardware and software support for the VTABS beyond the VSCS support period.

3.19.8.1.2 Software Maintenance

3.19.8.1.2.1 Contractor-Provided Software Maintenance - The Government may direct the Contractor to provide all software (including firmware) maintenance for VTABS. In this case, the Contractor shall respond to requests to perform maintenance on the fielded VTABS which display software failures during operation, as well as respond to Government requests to modify VTABS software.

3.19.8.1.2.2 Escrow Account - The Contractor shall provide an escrow account for all VTABS software (including firmware) in accordance with 3.19.8.8.

3.19.8.2 National Airspace Integrated Logistics Support (NAILS) Program Requirements - A tailored NAILS program shall be implemented for VTABS.

3.19.8.2.1 Logistics Support Data - For all unique VTABS LRUs, the Contractor shall support a FAA effort to assemble logistics support data with existing contractor formatted data. This support shall be limited to review and duplication of all drawings in existing contractor format, and access to unique hardware components as required.

3.19.8.3 Other Documentation Update - The Contractor shall provide a VTABS Post Production Support Plan (CDRL VP113) and Life Cycle Cost Document (CDRL VP114) to incorporate the support requirements of the unique components of VTABS, the Transition Switch, and any identified VTABS PSE.

3.19.8.4 Supply Support/Spares

3.19.8.4.1 Installation - During the installation and test period, the Contractor shall be responsible for all supply support activities for maintenance and consumable items. Spares utilized in the process of providing this support shall be the property of the Government.

3.19.8.4.2 After Government Acceptance - After site acceptance of the VTABS all supply support will be the responsibility of the Government. Spares utilized in the process of providing this support shall be the property of the Government.

3.19.8.4.3 Site Spares - The Contractor shall deliver to the Government a list in Contractor format of recommended site replaceable spares, assemblies, and consumables for each site configuration. The list shall include the vendor name, part number, national stock number (if applicable/available), item description, estimated unit cost, mean-time-between-failure (MTBF), mean-time-to-repair (MTTR), and recommended quantity information.

The contractor shall deliver a set of site spares to each site, as delineated in the recommended site replaceable spares list.

3.19.8.4.4 Depot Spares - The Contractor shall deliver a set of recommended VTABS unique depot spares, to include LRUs, piece parts and consumables. The Contractor shall deliver appropriate spare parts, LRUs, assemblies, consumables and spare parts peculiar to the FAA depot by CAI for each respective site.

3.19.8.5 Support and Test Equipment

3.19.8.5.1 Tools and Test Equipment - All common and special tools and test equipment that are not an integral part of the end item but are required to inspect, test, calibrate, service, repair, or overhaul an end item shall be identified to the Government. The Contractor shall submit in Contractor format a list of proposed VTABS tools and test equipment (VP116).

3.19.8.5.2 Special Tools and Test Equipment - Any requirement for special tools and test equipment that have a single or peculiar application to a specific end item shall be minimized. Special tools and test equipment are any tools or test equipment that are not commercially available and are used to perform a specific operation on a specific piece(s) of material and which are necessary for servicing, adjusting, or maintaining the end item.

Existing VSCS special tools and test equipment shall be used to the maximum extent possible. The Contractor shall submit in Contractor format a list of proposed VTABS and Transition Switch special tools and test equipment (VP117).

3.19.8.5.2.1 Delivery of Special Tools and Test Equipment - The Contractor shall provide and deliver with the site equipment a complete set of special tools and a complete set of any special test equipment needed for site maintenance including: test cables, connectors, extender kits, adapters, software, and all other items required to permit use of the special test equipment with VTABS hardware, firmware, and software. Special tools and test equipment that are common to the VSCS shall not be delivered.

The Contractor shall provide and deliver a set of special tools and special test equipment not common to the VSCS to both the FAAAC and to the FAATC.

Any computers, printers, tools and/or test equipment obtained by the Contractor, and charged to the VTABS effort, shall be considered Contractor- acquired Government property. After all VTABS systems have been delivered, installed, and accepted by the Government, the Contractor shall provide a complete list of such items and request disposition instructions from the FAA Contracting Officer.

3.19.8.5.2.2 Special Test Procedures and Techniques - Any formal or informal test procedures or techniques used by the Contractor (e.g., fault injection) during the VTABS FAT shall be documented by the Contractor. Any formal or informal test procedures or techniques used by the Contractor during the VTABS FAT shall be reproducible at the FAATC on the FAATC VTABS. Any formal or informal test procedures or techniques used by the Contractor during the VTABS FAT shall be made available to the Government-appointed test director or designated representative.

3.19.8.5.2.3 Calibration Maintenance Requirements Summary (CMRS) - The Contractor shall develop and provide a CMRS, in Contractor format, for all newly designed VTABS support equipment that requires calibration.

3.19.8.6 Manuals and Instruction Books - The Contractor shall provide the technical manuals, user guides, and publications listed below.

The Contractor shall identify commercially available manuals needed for the VTABS and Transition Switch, identify any site/location-unique requirements, and provide methods for addressing these requirements in the manuals. The following manuals and instruction books shall be provided as separate information to existing VSCS documentation, and as defined in CDRL VP99 and its associated DID. FAA-D-2494/b shall be used as guidance. Compliance with Appendix I of FAA-D-2494/b is required.

- a. VTABS System Maintenance Manual - Including Start-up, Shutdown, SW initialization and how to load software. Specifically, this manual shall enable a trained site maintenance person to perform on-site software and hardware maintenance activities. These activities include loading new software builds, adding to and deleting resources, creating and modifying site configuration maps, and identify configuration of software releases. This manual shall also include a description of the VTABS features, their interactions and interfaces, and normal and failure modes.
- b. VTABS User's Manual - consisting of information for Master Instructor, DEO and Supervisor (MIDS).

3.19.8.6.1 VTABS Drawings and Lists

3.19.8.6.1.1 Engineering Drawings and Lists - As ordered, the Contractor shall develop engineering drawings (equivalent to Level 2 Drawings, in Contractor format) for those items unique to VTABS. The Contractor shall deliver reproducible copies (e.g., vellum, mylar, sepia, or electronic media) of these drawings in accordance with VP112.

3.19.8.6.1.2 Site Installation Drawings - The contractor shall generate site installation drawings to reflect the final as-built VTABS installation. The drawings shall include site specific configurations, and equipment adjustments. Site specific installation drawings shall be delivered to the Government in accordance with CDRL item VP115 in CD-ROM format.

3.19.8.6.1.2.1 Red-lines to DSR Drawings - The Contractor shall red-line Government-provided DSR drawings to reflect VTABS installation (DYSIM and operational positions).

3.19.8.6.1.3 Installation Drawings and Instructions - The Contractor shall provide to each site, a copy of their internal installation drawings, instructions, etc., upon completion of the Site Acceptance Test. These drawings shall be in Contractor format and will be used by the sites until the Site Specific Maintenance Manual and Drawings are delivered.

3.19.8.6.2 Version Description Document - The Contractor shall deliver a Version Description Document in accordance with CDRL VP103 that identifies the as-built software delivered with the system. The Government intends to publish this document electronically through CD-ROM distribution.

3.19.8.6.3 Commercial Software Manuals - The Contractor shall deliver all commercial manuals, hardware and software, required for the design, development, production, installation and operation of the delivered VTABS in accordance with CDRL VP111.

3.19.8.6.4 Software Maintenance Manuals - The Contractor shall provide the Government access to software development materials, including but not limited to the Software Development Folders. It is the Government's intention to make copies, as appropriate, of the software developers' working materials, data files and specifications, to use during Government maintenance of VTABS.

3.19.8.6.4.1 Software Maintenance Manual, Level 2 - As ordered, this volume shall enable trained software engineers to perform 2nd level maintenance on the VTABS application (non-COTS) software. This volume shall contain the architecture, design, interfaces and source code of the as-built application (non-COTS) software delivered with VTABS. The volume shall include the database design. Source code for any non-COTS firmware used in VTABS shall be provided. Compiler/assembler information required in this volume shall include details on the software environment used to produce the software including lists of commercial software products and tools required. The Government encourages the use of self-documenting source code and data dictionary for details of the design. The Government intends to publish this document electronically via CD-ROM distribution. It shall be delivered in accordance with CDRL VP102.

3.19.8.6.5 Firmware Support Manual - As ordered, the Contractor shall develop a Firmware Support Manual that contains the information for producing firmware for the system. The Contractor shall deliver the Firmware Support Manual in Contractor format, CDRL VP104. The Government intends to publish this document electronically via CD-ROM distribution.

3.19.8.7 Contractor Support Services - As ordered, the Contractor shall furnish installation, checkout, engineering, maintenance, technical, software, testing, and supplemental support services for the VTABS. The Contractor shall provide support services to the Government Operational Test and Evaluation (OT&E) and System Shakedown Testing (SST) activities, or as otherwise ordered by the Government.

3.19.8.7.1 Contractor Support Services at the FAATC - The Contractor shall provide engineering, hardware and software maintenance support services at the FAATC, as part of the Contractor's on-going VSCS support.

The Contractor shall provide, as a minimum, the following support during Contractor and Government-conducted testing at the FAATC:

- a. Maintaining the VTABS,
- b. Modifying the adapted database to provide needed communications at the various positions,
- c. Operating the VTABS,
- d. Performing cold start, warm start, and data reduction,
- e. Modifying/correcting reconfiguration maps, and
- f. Hardware and software problem investigation and isolation and hardware problem resolution.

3.19.8.7.1.1 Contractor Engineering Support Services at the FAATC - As ordered, the Contractor shall provide engineering support services beginning with CAI of the VTABS system at the FAATC. These shall include, but not be limited to, assistance in operating the VTABS, providing resolution of VTABS user problems, resolution of interface problems, verification of VTABS requirements to user, engineering assistance in software loads and configuration map database updates, support of Government RMA testing, on-the-job training (OJT) on the VTABS hardware and software, and testing VTABS software and hardware modifications. If ordered, the Contractor shall provide and integrate the support hardware and software necessary for the FAATC to manage, maintain, and enhance the FAATC VTABS system hardware and/or software, and provide the capabilities necessary to reflect any operational site configuration.

3.19.8.7.1.2 Contractor Hardware Maintenance Support Services at the FAATC - Hardware maintenance support shall be provided in the existing VSCS CLINs. The Contractor shall furnish maintenance support services for site level hardware maintenance for the VTABS at the FAATC. The maintenance support services shall include hardware maintenance, repair, restoration, validation, verification, and site supply support. The Contractor shall repair or replace for operational use, all failed LRUs.

The Contractor shall begin the maintenance support service at the FAATC upon CAI of the VTABS system. The maintenance support shift coverage for the VTABS at the FAATC shall be the same as that provided for the VSCS.

3.19.8.7.1.3 Contractor Software Maintenance Support Services at the FAATC - Software maintenance support shall be provided in the existing VSCS CLINs. As ordered, the Contractor shall furnish software maintenance and software technical support for the VTABS following SAT regression testing at the FAATC, through all incremental releases, updates, and problem resolutions. This effort shall be provided by the Contractor technical support personnel located at both the Contractor's facility and at the FAATC. The Contractor shall maintain the VTABS software, including performing upgrades and making corrective fixes, as directed by the Government. Software engineers and programmers that are fully trained in the maintenance of the VTABS software shall be provided as technical support personnel. All software changes and software technical support, including upgrades and corrective fixes, if caused by a latent defect, shall be performed at the Contractor's expense.

3.19.8.7.2 Contractor Support Services at the FAAAC - As ordered, the Contractor shall provide engineering and maintenance support services at the FAAAC, as part of the Contractor's on-going VSCS support.

3.19.8.7.2.1 Contractor Engineering Support Services at the FAAAC - As ordered, the Contractor engineering support services shall include, as a minimum, providing resolution of VTABS user problems, resolution of interface problems, verification of VTABS requirements to user, engineering assistance in software loads and configuration map database updates, support of Government RMA testing, and on-the-job training (OJT) on the VTABS hardware and software.

3.19.8.7.2.2 Contractor Maintenance Support Services at the FAAAC - As ordered, the Contractor shall furnish maintenance support services for site/intermediate and depot level hardware maintenance for the VTABS at the FAAAC at the same level of effort as that provided for the VSCS. The VTABS shall be considered as part of VSCS and site maintenance shall be provided under existing VSCS CLINs.

3.19.8.7.3 Contractor Repair Service (CRS) - The CRS shall provide for the repair of selected repairable items to the extent not covered by warranty or other provisions of this Contract. The CRS shall include all labor, tools, test equipment, software, facilities, material, and any other technical and administrative support necessary to repair VTABS hardware repairable items to the extent not covered by warranty or other provisions of this contract.

3.19.8.7.3.1 Repairable Items - The Contractor shall restore repairable items to a serviceable condition. Repairable items are items of a durable nature which, when unserviceable, normally can be restored to a serviceable condition by a repair activity.

3.19.8.7.3.2 Testing, Inspection, and Quality Control - Test methods, approval of test methods, testing, and product acceptance test data forms for the CRS shall be accomplished by the Contractor in accordance with FAAD-STD-1293. Quality control of the CRS shall be in accordance with FAA-STD-016 and/or American National Standards.

3.19.8.7.3.3 Repair Priorities - The Contractor shall repair and return repairable items in accordance with the priorities established for the VSCS equipment repairs.

3.19.8.7.3.4 Shipment of Repairable Items - The Contractor shall pack, package, and ship repairable items in accordance with FED-STD-102, MIL-STD-794, MIL-E-17555, MIL-P-116, ASTM-D-3951, and DOD-STD-1686.

3.19.8.7.3.5 Repair Procedures - The Contractor shall accomplish all repairs in accordance with the repair procedures established for the VSCS.

Any modifications to items required by the contract or National Airspace System Change Proposal (NCP) and not previously accomplished, shall be accomplished by the Contractor at the time of repair. The Government will provide current NCPs to the Contractor.

The Government reserves the right to inspect and verify all repairs at the Contractor's facility or the point of receipt of the item. Sample inspections by the Government will be accomplished in accordance with MIL-STD-105.

3.19.8.7.3.6 Data Submittals, Data Accumulation, and Reports - The Contractor shall complete AC Form 4680-2, E & R Quality Feedback Tag, and the test data forms specified in FAAD-STD-1293, paragraphs 3.2.22 and 3.3.3, for each repairable item.

3.19.8.7.3.7 Points of Contact and Shipping Points - The Contractor shall furnish specific offices, names of individuals, and contact points of Contractor representatives subsequent to establishment of the CRS.

3.19.8.7.4 Pre-Acceptance Maintenance Support - The Contractor shall be responsible for all equipment maintenance, including spares and test equipment, at each site until the site is accepted by the Government.

3.19.8.7.5 Technical Assistance - As ordered, the Contractor shall provide technical assistance to Government personnel for the maintenance of VTABS hardware, firmware, software, and for training.

3.19.8.8 Life Cycle Parts and Service Data - As ordered by the Government, the Contractor shall deliver a complete set of the technical documentation, including proprietary information, for the VTABS system. Changes approved under the Contractor's configuration management program, shall be applied to the data in escrow. The escrow account shall include the following data:

- a. Products drawings and associated lists;
- b. Special inspection equipment drawings and associated lists;
- c. Special inspection equipment operating instructions;
- d. Special inspection equipment calibration procedures;
- e. Special tooling drawings and associated lists;
- f. Software source code and associated documentation;
- g. Reproduction rights for non-Commercial-Off-The-Shelf (non-COTS) items;
- h. Software development suite; and
- i. Test equipment.

The Contractor shall provide a source for repair, service, and replacement LRUs/parts for the VTABS during the entire period of this contract. If the Contractor fails to provide support for the VTABS before the expiration of this contract, the Contractor shall agree to a complete and unconditional release of the data in escrow at the price established in this contract or a price negotiated between the Government and the Contractor.

3.19.9 Training

3.19.9.1 General Requirements - The Contractor shall provide the following training courses. These training courses are to be designed and based on the assumption that all attendees will be previously trained VSCS personnel. The training shall be provided to teach the differences between VSCS operation and VTABS operation. Several of the training courses identified below require similar content and certain courses shall be developed in Computer Based Instruction (CBI) as outlined below. The Contractor is encouraged to modularize the training lessons to avoid duplication in the production of training materials.

3.19.9.1.1 OT&E Familiarization

3.19.9.1.1.1 VTABS OT&E Familiarization - This presentation shall provide, as a minimum, detailed instruction, including hands-on training without formal lab development on the operation and maintenance of the VTABS equipment, including the system documentation and its use. This provides AT and AF job skills and related training necessary to operate, maintain and perform database management functions on the VTABS during Government-conducted OT&E. Upon successful completion of this familiarization session, the participant will be able to perform the following functions:

- a. Operate the VTABS, Transition Switch, and VSCS/VTABS Interface;
- b. Maintain, run diagnostics, perform system restoration and/or repair actions, and database management functions on the VTABS in addition to performing test scenarios using test scripts and map data.

3.19.9.1.2 Air Traffic (AT) Training

3.19.9.1.2.1 VTABS AT Master Instructor/Supervisor Course - This course shall provide computer based instruction on the operation of the VTABS equipment. This training is intended as:

- a. A "train-the-trainer" course for VSCS AT instructor personnel responsible for operating the Dynamic Simulation (DYSIM) for ATC personnel training at each of the Government locations;
- b. A "train-the-trainer" course for VSCS NAS/NOM personnel at each of the Government locations;
- c. And train AT supervisors responsible for VTABS operation.

This course is identical to the AF Systems Overview Course described in 3.19.9.1.3.1.

3.19.9.1.2.2 VTABS AT Database Management Course - This course shall provide computer based instruction on the use of site specific adaptation data and configuration map data for building and maintaining site specific configuration maps. This course is identical to the AF Database Management Course described in 3.19.9.1.3.3.

3.19.9.1.3 Airway Facilities (AF) Training

3.19.9.1.3.1 VTABS AF Systems Overview Course - This course shall provide computer based instruction on the operation of the VTABS equipment. This training is intended as:

- a. A "train-the-trainer" course for VSCS AT instructor personnel responsible for operating the Dynamic Simulation (DYSIM) for ATC personnel training at each of the Government locations;
- b. A "train-the-trainer" course for VSCS NAS/NOM personnel at each of the Government locations;
- c. And train AT supervisors responsible for VTABS operation.

This course is identical to the AT Master Instructor/Supervisor Course described in 3.19.9.1.2.1.

3.19.9.1.3.2 VTABS AF Site Maintenance Course - This course shall provide, as a minimum, detailed technical instructions, including hands-on training, for VSCS site maintenance for personnel responsible for VSCS on site hardware and software maintenance.

3.19.9.1.3.3 VTABS AF Database Management Course - This course shall provide computer based instruction on the use of site specific adaptation data and configuration map data for building and maintaining site specific maps. This course is identical to the AT Database Management Course described in 3.19.9.1.2.2.

3.19.9.1.4 Software Support Training

3.19.9.1.4.1 VTABS Software Maintenance (Level 2) Training Course - As ordered, this course shall provide, as a minimum, detailed technical instructions, including using source code and hands-on-training, for VSCS second level software personnel responsible for second level software maintenance.

3.19.9.2 Course Outcome Requirements - The following are the minimum course outcomes for each required course.

3.19.9.2.2 Air Traffic (AT) Training

3.19.9.2.2.1 VTABS AT Master Instructor Course - This course shall provide computer based instruction on the operation of the VTABS training equipment including simulated practice in its use. This course is identical to the AF Systems Overview Course described in 3.19.9.1.3.1. Upon successful completion of this course, the student will be able to perform the following functions:

- a. Operate the VTABS;
- b. Manipulate, configure and reconfigure the system to meet operational, training and staffing requirements;
- c. Reconstruct position functions after interruptions;

- d. Identify and execute system communications; and
- e. Identify error messages/indications and take appropriate action.

3.19.9.2.2.2 VTABS AT Database Management Course - This course shall provide computer based instruction on the use of site specific adaptation data including simulated practice on building and maintaining site specific maps. This course is identical to the AF Database Management Course described in 3.19.9.1.3.3. Upon successful completion of this course, the student shall, as a minimum, have a detailed understanding of the VTABS Data Entry operation and be able to perform the following functions:

- a. Operate the VTABS;
- b. Add, modify and delete system resources; and
- c. Create and modify configuration maps.

3.19.9.2.3 Airway Facilities (AF) Training

3.19.9.2.3.1 VTABS AF Systems Overview Course - Upon successful completion of this course, the student will be able to perform the following functions:

- a. Operate the VTABS;
- b. Manipulate, configure and reconfigure the system to meet operational, training and staffing requirements;
- c. Reconstruct position functions after interruptions;
- d. Identify and execute system communications; and
- e. Identify error messages/indications and take appropriate action.

3.19.9.2.3.2 VTABS Site Maintenance Course - Upon successful completion of this course, the student shall, as a minimum, have knowledge of and be able to perform the following functions:

- a. Operate and maintain the VTABS equipment, Transition Switch, and VSCS/VTABS Interface in accordance with CDRL VP99;
- b. Identify and follow CDRL VP54 procedures applicable to all periodic maintenance requirements;
- c. Perform LRU remove and replace procedures;
- d. Use functional and flow diagrams, and test equipment to diagnose and isolate faults and malfunctions down to the appropriate LRU; and
- e. Perform required adjustments to the equipment to restore the equipment performance to specified parameters.
- f. Configure the VTABS for normal operation in accordance with technical instructions;

- g. Initialize and load software programs and perform system start-up.
- h. Perform installation of software updates.
- i. Execute diagnostic and error reporting modules, including interpreting and analyzing error and configuration messages.
- j. Collect system provided data to support analysis of software malfunctions, for example, Soft Exception Logs;
- k. Update and modify local data bases.

3.19.9.2.3.3 VTABS AF Database Management Course - Upon successful completion of this course, the student shall, at a minimum, have a detailed understanding of the VTABS Data Entry Operation and be able to perform the following functions:

- a. Operate the VTABS;
- b. Add, modify and delete system resources; and
- c. Create and modify configuration maps.

3.19.9.2.4 Software Support Training

3.19.9.2.4.1 VTABS Software Maintenance (Level 2) Training Course - Upon successful completion of this course, the student shall, at a minimum, be able to:

- a. Perform site software training course outcomes (3.19.9.2.3.2);
- b. Isolate and diagnose software malfunctions; and
- c. Write, update and modify the VTABS source code for all software and firmware.

3.19.9.3 Student Prerequisites - Students to be trained in the courses described in 3.19.9.1 section will be fully qualified in the appropriate VSCS functions.

3.19.9.4 Training Materials - The training materials provided for the AT and AF Training Courses (VP100) shall be developed with best commercial practices using FAA-STD-028 as a guide.

A student guide shall be provided for every course of instruction. The Contractor shall provide as a minimum course design guides, instructor guides, student materials and handouts, visuals and test questions.

The Contractor shall develop and deliver for Government approval, a Training Plan Letter Report in accordance with CDRL VP101 covering all proposed training courses. The report shall identify the training tasks, training outcomes, proposed training methods, equipment required to teach each course, and the approximate training time for each course.

3.19.9.4.1 COTS/NDI Training Materials - The Contractor may use COTS/NDI training course materials and documentation to satisfy VTABS training requirements of the training materials and documentation, provided that the materials:

- a. Satisfy the general course outcomes as described in 3.19.9.2; and
- b. Meet the minimum requirements for COTS training materials.

3.19.9.4.2 COTS/NDI Training Materials Requirements - As a minimum, COTS/NDI training materials submitted for Government review shall have:

- a. A table of contents prepared for the instructor's guide for each of the courses. The instructor's guide shall also include a summary of the course, including the lessons in the course(s), the lesson objectives, the estimated time for each lesson, the reference materials and equipment required, and any associated lesson handouts or support materials used, such as printed copies of viewgraphs, etc.
- b. Each lesson with each course shall have a three-part lesson objective.
- c. Lesson plans shall be provided for each lesson. Each course shall have a performance component to allow the student to practice the skills being taught.
- d. Tests shall be provided for each course and shall include both a written (student achievement) component and a performance component.
- e. A quick reference glossary which contains all of the acronyms used in the training materials shall be provided.
- f. Student guides shall be provided for each course.

3.19.9.5 Training Program Implementation - If the Contractor conducts training on Government-furnished equipment at a Contractor-provided and maintained Facility, then the Contractor shall, prior to the conduct of FAA personnel training, perform a SAT on the system and shall also demonstrate the system's training functionality. At the conclusion of Contractor-conducted training, the Contractor shall remove the equipment from the Contractor's facility and re-install the equipment, associated software, and documentation at a Government-designated location, demonstrate ability to conduct training, and conduct a modified SAT and CAI.

The modified SAT shall include a Contractor demonstration of all training functionality originally demonstrated at the Contractor's facility. The functionality of the reinstalled training equipment and software shall include a demonstration of all training functionality associated with the switchover between VSCS and VTABS, using the installed transition switch.

3.19.9.5.1 Contractor-Conducted Training and Familiarization

3.19.9.5.1.1 VTABS AT OT&E Familiarization - As ordered by the Government, the Contractor shall conduct a familiarization session for Government AT participants. Sessions will be conducted at the Contractor's facility or at a Government facility using Government-furnished equipment and Contractor-furnished training materials. A maximum of twelve (12) participants will participate in each session.

3.19.9.5.1.2 VTABS AF OT&E Familiarization - As ordered by the Government, the Contractor shall conduct a familiarization session for Government AF participants. Sessions will be conducted at the Contractor's facility or at a Government facility using Government-furnished equipment and Contractor-furnished training materials. A maximum of twelve (12) participants will participate in each session.

3.19.9.5.1.3 VTABS AF Site Maintenance Course - As ordered by the Government, the Contractor shall conduct VTABS site maintenance training at the Contractor's facility or at a Government facility using Government-furnished equipment and Contractor-furnished training materials. A maximum of twelve (12) students will participate in each class.

3.19.9.5.1.4 VTABS Software Maintenance (Level 2) Course - As ordered by the Government, the Contractor shall conduct second level software training at a Government facility, using Government-furnished equipment and Contractor-furnished training materials. A maximum of twelve (12) students will participate in each class.

3.19.9.5.2 Course Validation - The Contractor shall conduct a walk-through for each VTABS course and for the OT&E Familiarization session. The Contractor shall support one (1) In-Process Review (IPR) of course materials. The course walk-through shall be conducted using a training system and the same materials that will be used in the actual courses. A minimum of four (4) and a maximum of twelve (12) Government personnel will participate in each walk-through course.

The Contractor shall correct the errors, omissions, and deficiencies in the student and instructor materials discovered during each course walk-through. Materials shall be corrected prior to conducting any additional classes. The Contractor shall submit corrected copies of the course materials for review and approval prior to conducting classes.

3.19.9.5.3 Course Conduct - When VTABS training is conducted at a Contractor's facility, the Contractor shall utilize the Government-furnished VTABS training system for hands-on training, including test equipment and special tools, if required. The Contractor shall provide any soft consumable item(s), such as ESD wrist straps, needed to conduct training classes.

3.19.9.5.3.1 Instructional Materials - The Contractor shall provide each Government cadre and instructor participating in designated courses or OT&E Familiarization sessions a copy of all instructor materials (e.g., lesson plans, media materials, and student's guide and documentation) used in the course or briefing session. At the conclusion of the course or briefing session, the Government cadre and instructors shall retain all materials issued to them.

The Contractor shall provide each student participating in the other VTABS training courses the student guide and any handouts for the course. These instructional materials shall be retained by the student upon completion of the course.

The Contractor shall provide a set of classroom technical documentation reference materials, which will be retained in or near the classroom, as a reference library. The Contractor shall provide for Government approval a suggested list and quantities of reference materials needed for each course.

3.19.9.5.3.2 Class Roster and Certificate of Training - At the completion of designated classes, the Contractor shall deliver a Class Roster and a Certificate of Training for each course graduate to the Government. The class roster and certificate of training shall contain, as a minimum, course title, hours of training completed, location of the training, class start and end dates, student's name and social security number, and course grade (pass/fail).

3.19.9.5.3.3 End-of-Course Evaluation - At the completion of designated courses, the Contractor shall administer to the students a Government-provided end-of-course evaluation form and provide the completed forms to the Government within fifteen (15) days of class completion.

3.19.9.6 Delivery and Revision of Materials - All training materials delivered under the provisions of this contract shall be delivered to the Government without restrictive legend (i.e., the Government shall be given the right to reproduce any and all documentation for Government use only). All newly developed course materials shall be delivered in Microsoft Word for Windows, 6.0 or later. COTS Training Materials for which an electronic version is available shall be supplied in vendor format.

3.19.10 Quality Control Program

The Contractor shall provide and maintain a quality control system that meets the requirements of ISO-9000-3 and 9001. The Contractor does not have to be certified in order to satisfy this requirement, but shall have the system in place and follow the ISO Standards. The Contractor shall document his Quality Program in a VTABS Quality Assurance Plan and deliver that QA Plan to the Government 45 days after receipt of this revised Statement of Work or with the VTABS Proposal.

3.19.11 Government Review and Disposition of Government Comments to CDRL Items

Disposition of all FAA formal comments to submitted CDRL items will occur within 30 days after Contractor receipt of Government comments, and will be agreed to by the Contractor and the Government. Changes to reflect agreed-to resolutions shall be incorporated into the first CDRL submittal.

For VP102 and VP104, the Government shall participate in the Contractor internal review and validation cycle. The Contractor shall notify and provide the FAA five (5) copies of the document at least ten (10) working days prior to the Contractor's internal review meeting or validation. The Government review will occur over the next five (5) working day period immediately preceding the Contractor internal review, and may be on site. If requested, the Government may participate in a one-hour "kick-off" meeting with the Contractor team.

Following the five-day FAA-only review, the Government will participate in an on-site CDRL review meeting with the Contractor. No more than five FAA/FAA contractor representatives will participate in the meeting. During these five days, the Contractor shall collect comments, identify and assign action items, and list Government items and comments determined by the Contractor to be out-of-scope. These out-of-scope comments shall be provided to the FAA Contracting Officer. The Contractor shall use these comments to produce a "red-line" of the CDRL for the validation process, which the Government will monitor. The additional red-lines from the validation process shall be incorporated into the draft CDRL item and delivered to the Government for comment, in accordance with the VTABS comment process defined for all VTABS CDRL items.